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Box PATENT APPLICATION
Assistant Commissioner for Patents
Washington, D.C. 20231

Re: New U.S. Patent Application
Title: GOAL ORIENTED TRAVEL PLANNING SYSTEM
Inventors: Terrell B. Jones of Arlington, Texas and Joseph R. Offutt, Jr. of Grapevine, Texas

Sir:

We enclose the following papers for filing in the United States Patent and Trademark Office in connection with the above patent application.

a. Application - 35 pages, including 6 independent claims and 60 claims total.

b. Drawings - 18 sheets of informal drawings.

c. Declaration and Power of Attorney.

d. Recordation Form Cover Sheet and Assignment to The Sabre Group, Inc.

e. A check for $1,956 representing a $790 filing fee, $1,126 for additional claims, and $40.00 for recording the Assignment.

Please accord this application a serial number and filing date and record and return the Assignment to the undersigned.

This application relates to a disclosure document filed September 8, 1997, in the U.S. Patent and Trademark Office.

The Commissioner is hereby authorized to charge any additional filing fees due and any other fees due under 37 C.F.R. § 1.16 or § 1.17 during the pendency of this application to our Deposit Account No. 06-0916.

Respectfully submitted,

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UNITED STATES PATENT APPLICATION

OF

TERRELL B. JONES

AND

JOSEPH R. OFFUTT JR.

FOR

GOAL ORIENTED TRAVEL PLANNING SYSTEM

BACKGROUND OF THE INVENTION

Field of the Invention

This invention generally relates to travel processing systems and, more particularly, to a system for receiving a traveler's travel goals and determining possible travel options by searching a travel database.

Description of the Related Art

Computer systems for arranging airline travel are commonly used. Existing reservation systems allow a traveler or user to select the days that they wish to travel and their origination and destination sites. Based on these selections, the system tells the user both the fares available and the companies offering the fares.

These existing systems require the traveler to guess at what time they need to arrive at the destination airport to reach their final destination, such as the location of a meeting, on time. The traveler must determine the time required to travel from the airport to the final destination site and research what types of ground transportation are available at the destination airport. The traveler must then research which hotels, restaurants, and other activities are close to their final destination point of interest and make separate reservations.

Based on the above limitations of existing systems, it is desirable to improve travel processing systems to provide greater assistance to the traveler.

SUMMARY OF THE INVENTION

Systems and methods consistent with the present invention include structure and acts for processing travel requests based on a user's travel destination goal. That is, the user inputs a travel goal (e.g., the time and location of a meeting) and the system automatically generates a travel itinerary, including flight information, hotel information, and ground transportation such as rental cars, to ensure that the user accomplishes their travel goal (e.g., arrives at the meeting on time).

In accordance with systems and methods consistent with the present invention, a traveler's itinerary is generated interactively with a user by selecting flights, hotels, transportation, and other activities. To generate such an itinerary, the user first inputs a goal, like a meeting place and time. The travel system selects a destination airport, if one is not provided, and estimates a travel time between the destination airport and the destination goal. The travel system determines recommended flights and ground transportation to the user by searching a travel database having data on both and then displays the recommendations to the user. Similarly, restaurant and activity information may also be found in the database, and as such, appropriate recommendations may be displayed to the user based on user-designated constraints or default constraints.

In one embodiment of the present invention, systems and methods are provided for processing travel requests including structure or steps for receiving a user's travel goal specifying a destination location and an appointment time and determining a time of arrival necessary at a destination airport sufficient to ensure that the user arrives at the destination location at the appointment time.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate embodiments of the invention and, together with the description, serve to explain the objects, advantages, and principles of the invention.

In the drawings,

Fig. 1 depicts a data processing system suitable for use by systems and methods consistent with the present invention;

Fig. 2a depicts a flow chart of the steps performed by the travel system consistent with the present invention;

Fig. 2b depicts a sample screen display for entering travel parameters consistent with the present invention;

Fig. 3a depicts a flow chart of the steps performed when selecting flights consistent with the present invention;

Fig. 3b depicts a sample screen display showing a map and available flights consistent with the present invention;

Fig. 3c depicts a sample screen display showing the interior of a plane for the user to select a seat consistent with the present invention;

Fig. 4a depicts a flow chart of the steps performed when selecting hotels consistent with the present invention;

Fig. 4b depicts a sample screen display showing a map with a hotel location and other information about the hotel consistent with the present invention;

Figs. 5a and 5c depict flow charts of the steps for selecting ground transportation consistent with the present invention;

Fig. 5b depicts a sample screen display showing ground transportation information consistent with the present invention;

Fig. 6a depicts a flow chart of the steps for selecting restaurants and activities consistent with the present invention;

Fig. 6b depicts a sample screen display showing restaurant recommendations consistent with the present invention;

Fig. 7 depicts a flow chart of the steps for reviewing and approving an itinerary consistent with the present invention;

Fig. 8a depicts a flow chart of the steps for relaxing constraints consistent with the present invention;

Fig. 8b depicts a sample screen display showing an itinerary and criteria the user may adjust;

Fig. 8c depicts a sample screen display of additional criteria the user may designate as flexible consistent with the present invention; and

Fig. 8d depicts a sample screen display of an original itinerary and a reviewed itinerary based on relaxed constraints.

DETAILED DESCRIPTION

Reference will now be made in detail to the construction and operation of implementations consistent with the present invention illustrated in the accompanying drawings. In those drawings, like elements and operations are designated with the same reference numerals where possible.

Systems consistent with the present invention provide a travel system that generates a user's travel itinerary based on the user's travel goal. In one implementation, the travel itinerary includes air transportation; however in other implementations the itinerary includes a different type of transportation service where a third party provides scheduled transportation to consumers using a facility that carries consumers in groups, such as a train or bus. The travel system generates the itinerary interactively with a user by selecting, in one case, flights, hotels, ground transportation, restaurants, events, and other activities. A user need only input a goal, including a destination and required time to be at that destination, and based on this goal information, the travel system presents the user with alternatives that allow the user to meet these criteria. Other convenient information is presented to the user that is specifically tailored to the users' travel plans, including hotels, restaurants, and activities in the vicinity of the users travel goal.

In using the travel system, the user initially inputs the destination time and site and an origination site. The travel system then estimates the time necessary to arrive at a destination airport to reach the destination site at the designated time. After making the estimate, the travel system sends display data to a display located at the

user's site for displaying travel options, including potential departure and arrival flights, hotels, restaurants and activities.

A goal can include multiple stops in one location at different times, multiple cities, multiple meetings in multiple cities, non-round trip travel, and round trip travel. The processing of a goal that requires several different stops in different locations is performed in steps. For example, if a user wishes to travel from New York to San Francisco to Seattle, the travel from New York to San Francisco is processed first and then travel from San Francisco to Seattle is processed as discussed below. For clarity the only type of goals used in the examples below are between a single origination to a single destination. The system may easily be altered to process many different goal combinations.

Fig. 1 depicts a data processing system 50 for use with systems and methods consistent with the present invention, although other system configurations are contemplated. The data processing system 50 comprises a user computer 100 connected to travel computer 120 via a communication link 150, such as a direct network link, a modem, or the Internet. The travel computer 120 is connected to a computerized reservation system (CRS) 130 via communication link 160. Both the travel computer 120 and CRS 130 have access to a travel database 140.

Travel database 140 represents a plurality of databases containing many different types of data including, for example, flight information, hotel information, ground transportation information, activity information, airport information, map information, and travel distance and time information. Travel database 140 may be

maintained by travel computer 120 or CRS 130. Travel database 140 may be a virtual database, including data from multiple sources, for example, servers on the world wide web.

The user computer 100 has a central processing unit (CPU) 102, a memory 104, an input device 105, and a display 106. The memory 104 contains a presentation program 108 that displays various screens to the user via the display 106, receives input from the user, and sends this input to the travel computer 120. Available applications suitable for these purposes include Internet browsers such as the Netscape Navigator.

Travel computer 120 includes an input device 109, display 113, a CPU 110, and a memory 112. The memory 112 includes the travel system 114 of an exemplary implementation. The travel system 114 processes travel requests from the presentation programs on user computers and stores information about travel options. The travel system 114 includes an air transportation subsystem (ATS) 116 that selects flights or flights and prices, a hotel subsystem (HS) 118 that selects a hotel, an activity and restaurant subsystem (ARS) 122 that identifies restaurants and activities in the vicinity of the hotel or the destination site, a ground transportation subsystem (GTS) 124 that selects suitable ground transportation, a constraint relaxation subsystem (CR) 126 for relaxing search constraints, and a reservation confirmation system (RCS) 128 that verifies the travel selections and confirms any reservations.

CRS 130 is an existing transportation standard system that maintains information in a travel database 140 that relates to travel flight times and fares for each of the

different airlines among other flight information. Reservations are made through CRS 130. CRS 130 manages flight reservation information based on each user's desired origination-to-destination journey. CRS 130 generally arranges, organizes, and stores this data in a format generally corresponding to the dominant travel routing patterns, in which a carrier accepts a passenger at a first, origination location and discharges the passenger at a terminal or destination location.

Booking a flight through CRS 130 involves creating a computer record ~~called a name record~~. As flights are booked for different carriers, the system sends a message with the flight information to the airline's computers. The ~~name~~ record is used to generate tickets and store itineraries.

In accordance with the present invention, a user inputs travel parameters to the presentation program 108 on the user computer 100, which parameters are sent to the travel system 114 on the travel computer 120 for processing. The user may use a graphical user interface (GUI) to interface with the user computer 100, enter travel parameters and view travel information. These travel parameters include a destination, such as both the location of a meeting and the time of the meeting, and the user's origination site. Additionally, the user may input other parameters, such as an origination airport, origination city, destination city, destination airport, required arrival date and time, duration of visit, or required return time or date. For example, the user may indicate that he wishes to arrive at 123 Main St., New York at three o'clock in the afternoon and that he is leaving from Washington, D.C. The user may also designate additional preferences, such as leaving from National Airport and arriving in LaGuardia

Airport in New York. A user's profile may also be maintained in the memory 112 or an external storage system accessible by the travel computer 120 or the user computer 100 which includes travel preferences, such as preferred seats, airports, airlines, airplanes, modes of ground transportation such as rental cars, price range, or a seat class. After inputting the various parameters, the travel system generates an itinerary that ensures the user will arrive at the destination site on time in the manner he prefers.

A process consistent with one implementation of the present invention will now be described in connection with Figs. 2-8. The process steps may be performed in many different orders, only one of which is illustrated. Fig. 2a depicts a flowchart of the general steps of the travel system 114 of one embodiment of the present invention. First, the travel system 114 receives travel parameters from the user of the user computer 100 via the presentation program 108 (step 200). Fig. 2b shows an example initial screen displayed by the presentation program 108 to the user. Using this screen, the user may enter destination information such as an address, city, state, and time of appointment. After receiving the parameters, travel system 114 invokes the air transportation subsystem 116 to select flights or flights and prices (step 210). Travel system 114 then determines whether an overnight stay is necessary by determining whether the departure and return dates are the same (step 220). If different, the hotel subsystem 118 is invoked to select a hotel (step 230). The travel system 114 then determines whether it has received an indication from the presentation program of whether the user wants activity and restaurant information (step 235). If the user requests activity and restaurant information, the travel system 114 invokes the activity

and restaurant subsystem 122 to find restaurants and activities in the vicinity of the selected hotel or the destination site (step 240). After invoking the activity and restaurant subsystem 122 (step 240), or if the user does not want activity and restaurant information (step 235), travel system 114 invokes the ground transportation subsystem 124, which allows the user to select ground transportation such as cars (step 250). Finally, travel system 114 invokes the reservation confirmation system 128 allowing the user to verify travel selections and confirm reservations with the providers (step 260).

Fig. 3a shows more detailed steps of the air transportation subsystem 116 according to one embodiment of the present invention. First, the air transportation subsystem (ATS) 116 receives the user's travel parameters from the travel system 114 (step 300). Then ATS 116 identifies the destination airport closest to the destination, if the closest airport was not provided by the user (step 305). Based on the identified destination airport and the destination site, ATS 116 refers to data in travel database 140 to determine a distance between the destination airport and the destination site (step 310).

ATS 116 determines what ground transportation alternatives are available at the destination airport by referring to travel database 140 (step 320). ATS 116 determines the minimum and maximum ground travel time from the destination airport to the destination based on the distance between the airport and the destination, the modes of transportation available, the time of day of the travel, taking into account possible flight delays (step 330).

Based on the user's preferred arrival time at the destination and knowing the minimum and maximum time for ground travel between the destination airport and the destination, ATS 116 can calculate a flight arrival time at the destination airport. ATS 116 then searches travel database 140 for flights from the origination airport to the destination airport that arrive at the flight arrival time to find flight alternatives available to the user and sends this information to the presentation program for display to the user (step 340). The presentation programs also display seat alternatives for the available flights.

After displaying this information, the user may select a preferred flight and seat, and the presentation program sends these selections to ATS 116 (step 350). ATS 116 searches for return flight alternatives and sends data reflecting the same to the presentation program 108 (step 360). The presentation program 108 displays this information to the user, who may then pick a preferred return flight which is reported to ATS 116 (step 370) and select a seat which is reported to ATS 116 (step 375). Step 360 may be skipped if the user is not returning to the origination location. In addition the return flight search may be replaced by a next destination flight search if the user is moving on to another location.

Figs. 3b-3c show example screen displays presented on display 106 by presentation program 108. Fig. 3b shows a screen display with a map of the location of the destination and location of the destination airport. Fig. 3b also shows available flights and their times and prices from the origination city to the destination city. Fig. 3c shows a picture of the plane so that the user may select a seat.

Referring again to Fig. 3a, if the user has not found a suitable flight, the user may indicate to run the constraint relaxation subsystem (CR) 126 (step 377). If the user so indicates, ATS 116 runs the CR 126 subsystem to allow the user to consider alternative flights and to select one (step 380). After selecting a flight in either step 350 or step 370, ATS 116 will select or book selected flights using CR 126 (step 390) and will update an itinerary that is maintained with all the choices made by the user (step 395).

Fig. 4a is a flow chart of the steps performed by the hotel subsystem 118 (HS). HS 118 recommends hotels based on their proximity to the destination and any other parameters either set by the user or held in a user profile (step 400). HS 118 sends presentation program 108 a map for display that shows the location of the hotel (step 410). Geographic databases are commonly available that show streets and other landmarks. Also included in the display data is other information available in the database 140 about the hotel including hotel amenities (step 420). Fig. 4b shows a map including the location of the selected hotel relative to the location of the destination (i.e., the marker for "Your Appointment"), and information about the hotel. HS 118 receives data from presentation program 108 indicating whether the user has accepted one of the recommendations or rejected all of them (step 430). The user may accept one of the recommendations or reject all the recommendations. If the user does not accept any of the recommendations, the CR 126 re-executes searches using relaxed constraints and is used here to look for a larger range of hotels (step 440) and processing continues with step 400. If HS 118 determines that the user selected a

hotel, then HS 118 reserves the hotel using CRS 130 (step 450) and the itinerary is updated (step 460).

Fig. 5a shows the steps performed by the ground transportation subsystem 124 (GTS) for selecting ground transportation from the destination airport to the destination or to a selected hotel. GTS 124 sends the presentation program 108 display data for displaying a map showing the destination airport location, a destination location and a selected hotel location (step 500). The display shown in Fig. 4b includes such an example map display. The user may select one of several different types of transportation. The order in which the user is presented with the available modes of transportation is based on the ground transportation subsystems's recommended mode and a user's preferred mode as designated in a user travel profile. GTS 124 selects a preferred mode for a location from travel database 140. For example, if the user is traveling to New York City, renting a car is the least preferred mode of transportation. It is preferable to take public transportation or private transportation given the lack of parking. The user has the option of accepting the recommendation or choosing an alternative.

In Fig. 5a, GTS 124 sends display data to presentation program 108 providing the user the option of renting a car (step 510). If the user decides to rent a car, then GTS 124 sends display data representing rental car recommendations found in travel database 140 (step 515). Fig. 5b shows an example display on display 106 by presentation program 108 showing a rental car company and information about the car and allows the user the option of reserving it. The user may then select a rental car

(step 516) and a reservation is made (step 518). After making the reservation, the rental car is added to the itinerary (step 519). If the user did not select any of the displayed rental car recommendations, then GTS 124 invokes CR 126, broadening the scope of the search for the rental car recommendations by relaxing any constraints such as cost (step 517).

If the user chooses public transportation, GTS 124 sends presentation program 108 display data asking the user if he wishes to select public transportation (step 520), and if so, GTS 124 provides display data listing public transportation recommendations (step 522). The user may select a public transportation mode (step 524) that is then added to the itinerary (step 528). Otherwise, GTS 124 invokes CR 126 relaxing constraints in the search (step 526).

Fig. 5c shows additional steps of the ground transportation system. After determining if the user has selected public transportation, GTS 124 receives an indication from user computer 100 as to whether the user selects private transportation (step 530). If so, GTS 124 sends display data to presentation program 108 of available private transportation (step 532). The user may select one of the available private transportations using input device 105 (step 534) and if found to be reservable by GTS 124 (step 537) a reservation is made by GTS 124 (step 538). GTS 124 adds the transportation to the itinerary (step 539). If it is not reservable, then it is merely added to the itinerary (step 539). If the user did not select any of the modes of transportation, then GTS 124 skips the selection of ground transportation (step 540).

In one embodiment, at any time the user changes their mind and decides not to pursue a transportation type, the user may enter an indication of the same and enter a different transportation branch.

Fig. 6a shows the general steps for recommending restaurants and activities around the destination by the activity and restaurant subsystem (ARS) 122. ARS 122 refers to a database of restaurants and activities and their addresses held within travel database 140. If a user desires to select a restaurant (step 600) then ARS 122 sends display data to presentation program 108 to display a screen depicting restaurants by searching for geographically close restaurants to the hotel or destination and searching any other constraints entered by the user such as the type of food, amenities, ratings in the travel database (step 610). In this step, ARS 122 sends display data to presentation program 108 which displays a screen like the one shown in Fig. 6B. This screen depicts various restaurants and various features of the restaurants, like average meal cost, level of cleanliness, type of food, etc. The user makes various selections on this screen and the activity and restaurant subsystem performs various processing in response to these selections.

After displaying this screen, the user may enter a selection using input device 105 and presentation program reports the result to ARS 122 (step 615). If the user did not select a restaurant, then ARS 122 invokes CR 126 to allow the user to change any of various constraints on the selection of restaurants (step 620). Otherwise, if the user did select a restaurant and if the restaurant accepts reservations (step 625), ARS 122 makes a reservation (step 630), and the restaurant is added to the itinerary (step 635).

The user may request information about events and activities. If ARS 122 determines that the user requested information about events or activities (step 640), then ARS 122 searches for events and activities that meet any constraints placed by the user, such as requesting shopping or movies, and any found events and activities within a designated distance of the hotel, airport or destination are displayed (step 650). The user may select an event or an activity (step 655) and if reservable (step 665), the ARS 122 makes a reservation (step 670) and it is added to the itinerary (step 675). If no activity or event is selected, ARS 122 invokes CR 126 allowing the user to change any constraints on the types of activities or locations of activities or events (step 660). If the user does not wish to select any restaurants or activities, then the selection of restaurants or activities is skipped and processing continues (step 680).

Fig. 7 depicts a flow chart of the steps performed by the reservation confirmation system (RCS) 128, which allows a user to review an itinerary. Once the itinerary is complete, RCS 128 sends display data to presentation program 108 which in turn displays the itinerary for the user to review (step 700). The user indicates using input device 105 whether the itinerary is acceptable (step 710). If the itinerary is not acceptable, the user may alter the itinerary and reenter any of the decision subsystems (step 720). If the itinerary is acceptable, RCS 128 places the itinerary along with the associated restaurant, the maps and any other available information in a trip portfolio for printing, faxing or e-mailing or delivering to the user using any means desired by the user (step 730).

Fig. 8a depicts a flow chart of the steps performed by CR 126. CR 126 reviews a database query and allows the constraints in the query to be changed or automatically changes the constraints. If constraints in the query were continuous (step 800), such as a distance or time, then CR 126, either automatically or with user's input adjusts the constraint. For example, if the query is to find a restaurant with the constraint of being within 5 miles of a given hotel, the distance constraint may automatically be adjusted to 15 miles and the query rerun and the new results displayed on display 106 by presentation program 108 (step 810). If the previous constraints were discrete (step 820), such as food type, then the discrete constraint is changed by requesting a new entry from the user or using a default entry. For example, if the search is for restaurant with the food type of Italian, the constraint may be changed to American, and the query rerun and results displayed (step 830). If there were both discrete and continuous constraints in the last query search (step 840), then both may be relaxed separately as discussed above (step 850) and the new results displayed. If the user does not wish to change any of the constraints, processing may again continue (step 860). Many different parameters may be adjusted in CR 126, such as flight times, airports, flight fares, airlines, or seat class.

Figs. 8b-8d show example screen displays of data displayed on display 106 by presentation program 108 based on display data sent by CR 126. Fig. 8b shows an example screen display of an itinerary and criteria that may be adjusted. Fig. 8c includes additional criteria for the user to adjust by indicating a degree of flexibility. Fig.

8d shows an example screen display with the original itinerary and alternative itineraries based on the relaxed constraints.

There are many variations that may be made in accordance with the present invention. For example, the system could allow the user to enter many different types of criteria. The system may accept input in a different order, for example if the return date is of importance the user return flight may be selected before departure flight.

The example implementations above specifically mention air travel , however, the present invention may be used in conjunction with any type of travel including trains and buses. Similarly all references to airport may alternatively be any transportation terminal.

The foregoing description of an implementation of the invention is presented for purposes of illustration and description. It is not exhaustive and does not limit the invention to the precise form disclosed. Modifications and variations are possible in light of the above teachings or may be acquired from practicing the invention. For example, the described implementation includes software, but the present invention may be implemented as a combination of hardware and software or on hardware alone. The scope of the invention is defined by the claims and their equivalents.

WHAT IS CLAIMED IS:

1. A data processing system for processing travel requests using a travel database, comprising:

a memory including program instructions; and

a processor operating responsive to the program instructions to:

receive a travel goal specifying a destination location and an appointment time for arrival at the destination location;

access the travel database to locate travel information corresponding to the destination location and the appointment time; and

determine an arrival time within a vicinity of the destination location using the located travel information to ensure arrival at the destination location by the appointment time.

2. The system of claim 1 wherein a plurality of travel stations are within the vicinity of the destination location, and wherein the processor further operates responsive to the program instructions to:

select one of the plurality of travel stations; and

determine available modes of transportation between the selected travel station and the destination location.

3. The system of claim 2 wherein the processor further operates responsive to the program instructions to:

display the available modes of transportation; and

receive a selection of one of the available modes of transportation.

4. The system of claim 1 wherein the travel information includes a plurality of travel options available at the travel station, and wherein the processor further operates responsive to the program instructions to:

select one of the plurality of travel options that arrives at the travel station at the time of arrival sufficient to ensure arrival at the destination location by the appointment time.

5. The system according to claim 4 wherein the processor further operates responsive to the program instructions to

display data listing the plurality of travel options; and

receive an indication of a selected travel conveyance.

6. The system according to claim 4 wherein the processor further operates responsive to the program instructions to

display data listing the plurality of travel options; and

receive an indication of a selected travel flight.

7. The system according to claim 4, further comprising instructions to:

maintain a profile of travel preferences, wherein the travel option selection is based on the travel preferences.

8. The system according to claim 1 wherein the processor further operates responsive to the program instructions to:

receive a travel return date; and

display a list of return travel options from the travel station on the travel return date.

9. The system according to claim 1 wherein the processor further operates responsive to the program instructions to:

determine whether an overnight stay is required; and

display a list of hotels for selection.

10. The system according to claim 9 wherein the processor further operates responsive to the program instructions to:

receive a selection of one of the hotels; and

reserve a room at the selected hotel.

11. The system of claim 1 wherein the processor further operates responsive to the program instructions to locate restaurants in a vicinity of the destination site.

12. The system according to claim 11 wherein the processor further operates responsive to the program instructions to:

search a restaurant database for restaurants in the vicinity of the destination location.

13. The system of claim 11, wherein the processor further operates responsive to the program instructions to locate restaurants includes an instruction to:

display the determined restaurants.

14. The system according to claim 1 wherein the processor further operates responsive to the program instructions to locate activities in a vicinity of the destination location.

15. The system of claim 14 wherein the processor further operates responsive to the program instructions to locate activities includes an instruction to:

search an activities database for the activities in the vicinity of the destination location.

16. The system of claim 14 wherein the processor further operates responsive to the program instructions to locate activities includes an instruction to:

display a list of the determined activities.

17. The system of claim 1 wherein the processor further operates responsive to the program instructions to provide travel information in accordance with the determined arrival time.

18. The system of claim 17 wherein the travel information includes geographic data for travel between the travel station and the destination.

19. The system of claim 1 wherein the travel goal may include a plurality of legs of travel each leg of travel including a different destination location and appointment time for arrival at the destination location.

20. A computer-readable medium containing instructions for processing travel requests using a travel database by:

receiving a travel goal specifying a destination location and an appointment time for arrival at the destination location;

accessing the travel database to locate travel information corresponding to the destination location and the appointment time; and

determining an arrival time within a vicinity of the destination location using the located travel information to ensure arrival at the destination location by the appointment time.

21. The medium of claim 20 wherein a plurality of travel stations are within a vicinity of the destination location, and wherein the instruction for determining includes instructions to:

select one of the plurality of travel stations; and

determine available modes of transportation between the selected travel station and the destination location.

22. The medium of claim 21 wherein the instruction for determining available modes of transportation further includes instructions to:

display the available modes of transportation; and

receive a selection of one of the available modes of transportation.

23. The medium of claim 20 wherein a plurality of travel options are available at a travel station, and wherein the instruction for determining includes instructions to:

select one of the plurality of travel options that arrives at the travel station at the time of arrival sufficient to ensure arrival at the destination location by the appointment time.

24. The medium according to claim 23 wherein the instruction for selecting further includes instructions to:

display data listing the plurality of travel options; and

receive an indication of a selected travel conveyance.

25. The medium according to claim 23 wherein the instruction for selecting further includes instructions to:

display data listing the plurality of travel options; and

receive an indication of a selected travel flight.

26. The medium according to claim 23 further including instructions to:

maintain a profile of travel preferences, wherein the travel option selection is based on the travel preferences.

27. The medium according to claim 20 further including instructions to:

receive a travel return date; and

display a list of return travel options from the travel station on the travel return date.

28. The medium according to claim 20 further including instructions to:

determine whether an overnight stay is required; and

display a list of hotels for selection.

29. The medium according to claim 28 further including instructions to:

receive a selection of one of the hotels; and

reserve a room at the selected hotel.

30. The medium of claim 20 further including an instruction to locate restaurants in a vicinity of the destination site.

31. The medium according to claim 30 wherein the instruction to locate restaurants includes an instruction to:

search a restaurant database for restaurants in the vicinity of the destination location.

32. The medium of claim 30, wherein the instruction to locate restaurants includes an instruction to:

display the determined restaurants.

33 The medium according to claim 20 further including an instruction to locate activities in a vicinity of the destination location.

34. The medium of claim 33 wherein the instruction to locate activities includes an instruction to:

search an activities database for the activities in the vicinity of the destination location.

35. The medium of claim 33 wherein the instruction to locate activities includes an instruction to:

display a list of the determined activities.

36. The medium of claim 20 further including an instruction to provide travel information in accordance with the determined arrival time.

37. The medium of claim 36 wherein the travel information includes geographic data for travel between the travel station and the destination.

38. The medium of claim 21 wherein the travel goal may include a plurality of legs of travel each leg of travel including a different destination location and appointment time for arrival at the destination location.

39. A method for processing travel requests using a travel database comprising the steps of:

receiving a travel goal specifying a destination location and an appointment time arrival at the destination location;

accessing the travel database to locate travel information corresponding to the destination location and the appointment time; and

determining an arrival time within a vicinity of the destination location using the located travel information to ensure arrival at the destination location by the appointment time.

40. The method of claim 39 wherein a plurality of travel stations are within a vicinity of the destination location, and wherein the step for determining includes steps to:

select one of the plurality of travel stations; and

determine available modes of transportation between the selected travel station and the destination location.

41. The method of claim 40 wherein the step for determining available modes of transportation further includes steps to:

display the available modes of transportation; and

receive a selection of one of the available modes of transportation.

42. The method of claim 39 wherein a plurality of travel options are available at a travel station, and wherein the step for determining includes the step of:

selecting one of the plurality of travel options that arrives at the travel station at the time of arrival sufficient to ensure arrival at the destination location by the appointment time.

43. The method according to claim 42 wherein the step for selecting further includes steps to:

display data listing the plurality of travel options; and

receive an indication of a selected travel conveyance.

44. The method according to claim 42 wherein the step for selecting further includes steps to:

display data listing the plurality of travel options; and

receive an indication of a selected travel flight.

45. The method according to claim 42 further comprising the step of:

maintaining a profile of travel preferences, wherein the travel option selection is based on the travel preferences.

46. The method according to claim 39 further including steps to:

receive a travel return date; and

display a list of return travel options from the travel station on the travel return date.

47. The method according to claim 39 further including steps to:

determine whether an overnight stay is required; and

display a list of hotels for selection.

48. The method according to claim 47 further including steps to:

receive a selection of one of the hotels; and

reserve a room at the selected hotel.

49. The method of claim 39 further including the step of locating restaurants in a vicinity of the destination site.

50. The method according to claim 49 wherein the step of locating restaurants includes the step of:

searching a restaurant database for restaurants in the vicinity of the destination location.

51. The method of claim 49, wherein the step of locating restaurants includes the step of:

displaying the determined restaurants.

52. The method according to claim 39 further including the step of locating activities in a vicinity of the destination location.

53. The method of claim 52 wherein the step of locating activities includes the step of:

searching an activities database for the activities in the vicinity of the destination location.

54. The method of claim 51 wherein the step of locating activities includes the step of:

displaying a list of the determined activities.

55. The method of claim 39 further including a step of providing travel information in accordance with the determined arrival time.

56. The method of claim 55 wherein the travel information includes geographic data for travel between the travel station and the destination.

57. The method of claim 39 wherein the step of receiving a travel goal includes the steps of

receiving a plurality of legs of travel each leg of travel including a different destination location and appointment time for arrival at the destination location.

58. A method for processing travel requests including the steps of:

receiving a travel goal including a destination location and an appointment time;

recommending a plurality of travel options and recommending a plurality of secondary modes of transportation based on the travel goal;

invoking a transportation decision system to select one of the plurality of travel options and one of the secondary modes of ground transportation based on the recommended travel options and the recommended secondary ground transportation;

determining whether an overnight stay is required;

invoking a hotel decision support system to select a hotel when it is determined that an overnight stay is required; and

invoking an activity and restaurant decision support system to select activities and restaurants in a vicinity of the destination location.

59. A memory for access by a computational entity being executed by a processor including:

a transportation subsystem having instructions to select modes and times of transportation;

a hotel subsystem having instructions to select hotels in a vicinity of a destination site;

activity and restaurant subsystem having instructions to select activities or restaurants near a destination site; and

ground transportation subsystem having instructions to select ground transportation to a destination site.

60. A system for searching for travel alternatives in a travel database including:

a memory including program instructions; and

a processor operating responsive to the program instructions to:

receive a request indicating a travel plan;

adjust the travel plan in accordance with stored travel constraints; and

search the travel database for travel alternatives that meet the adjusted travel plan.

ABSTRACT

A travel system for processing travel requests based on a user's travel destination goal such as a meeting place and time. The travel system selects a destination terminal, if one is not provided, and estimates a travel time between the destination terminal and the destination goal. An itinerary is then built interactively with the user selecting air, bus or train transportation, ground transportation, and, optionally, hotels, restaurants, and activities.

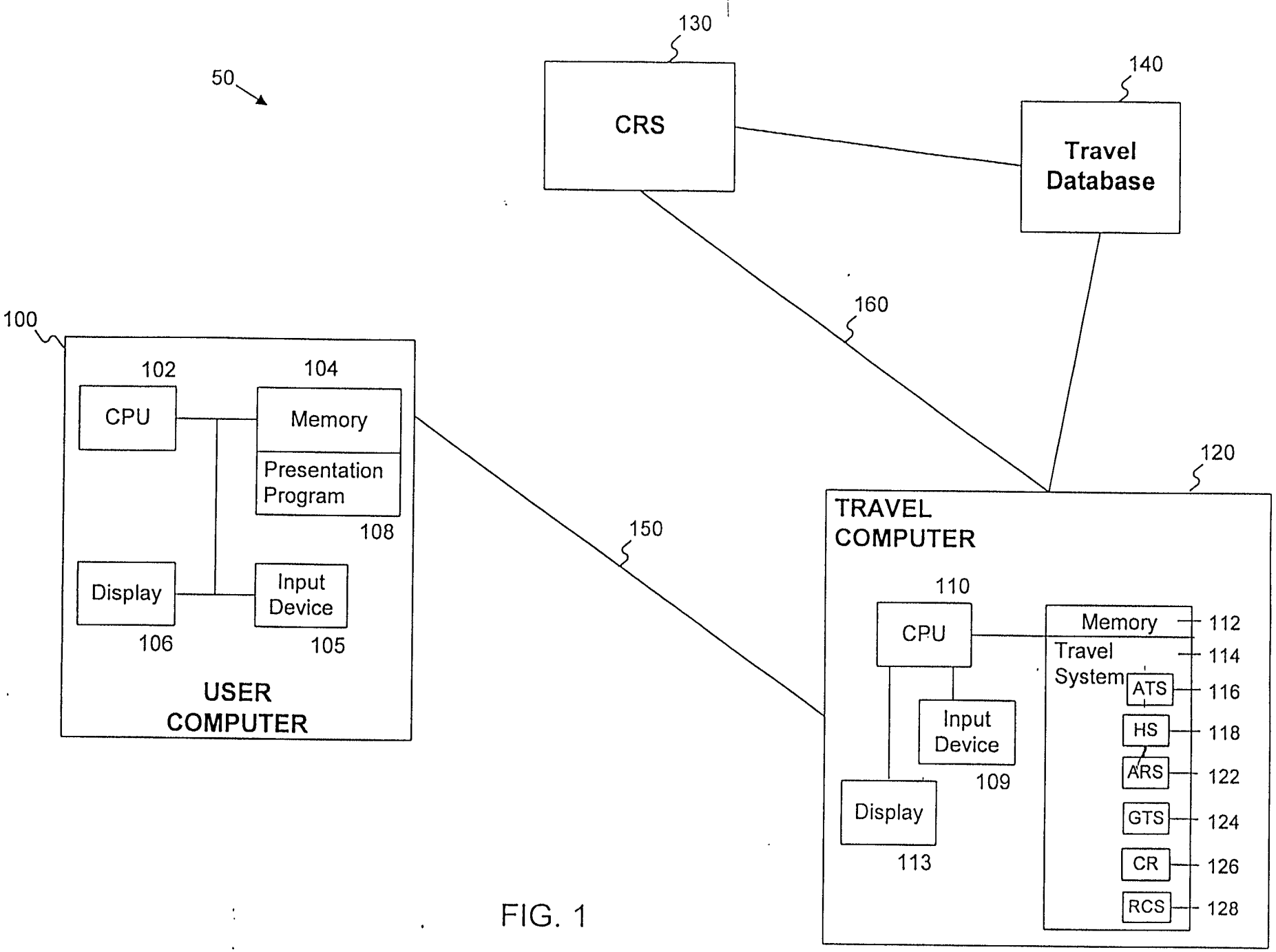


FIG. 1

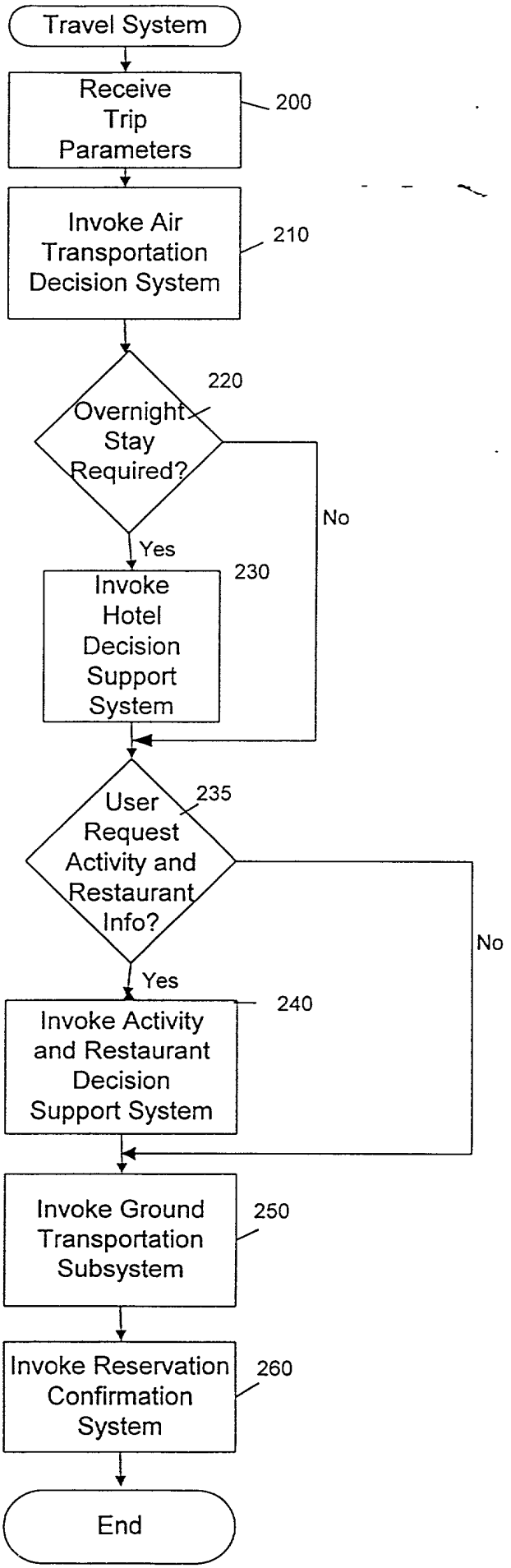

Travel System
Receive Trip Parameters
200
Invoke Air Transportation Decision System
210
Overnight Stay Required?
220
No
Yes
Invoke Hotel Decision Support System
230
User Request Activity and Restaurant Info?
235
No
Yes
Invoke Activity and Restaurant Decision Support System
240
Invoke Ground Transportation Subsystem
250
Invoke Reservation Confirmation System
260
End

FIG. 2a

Goal Seeker

Your Destination

Street Address

City

State

Your Appointment

Date

Time

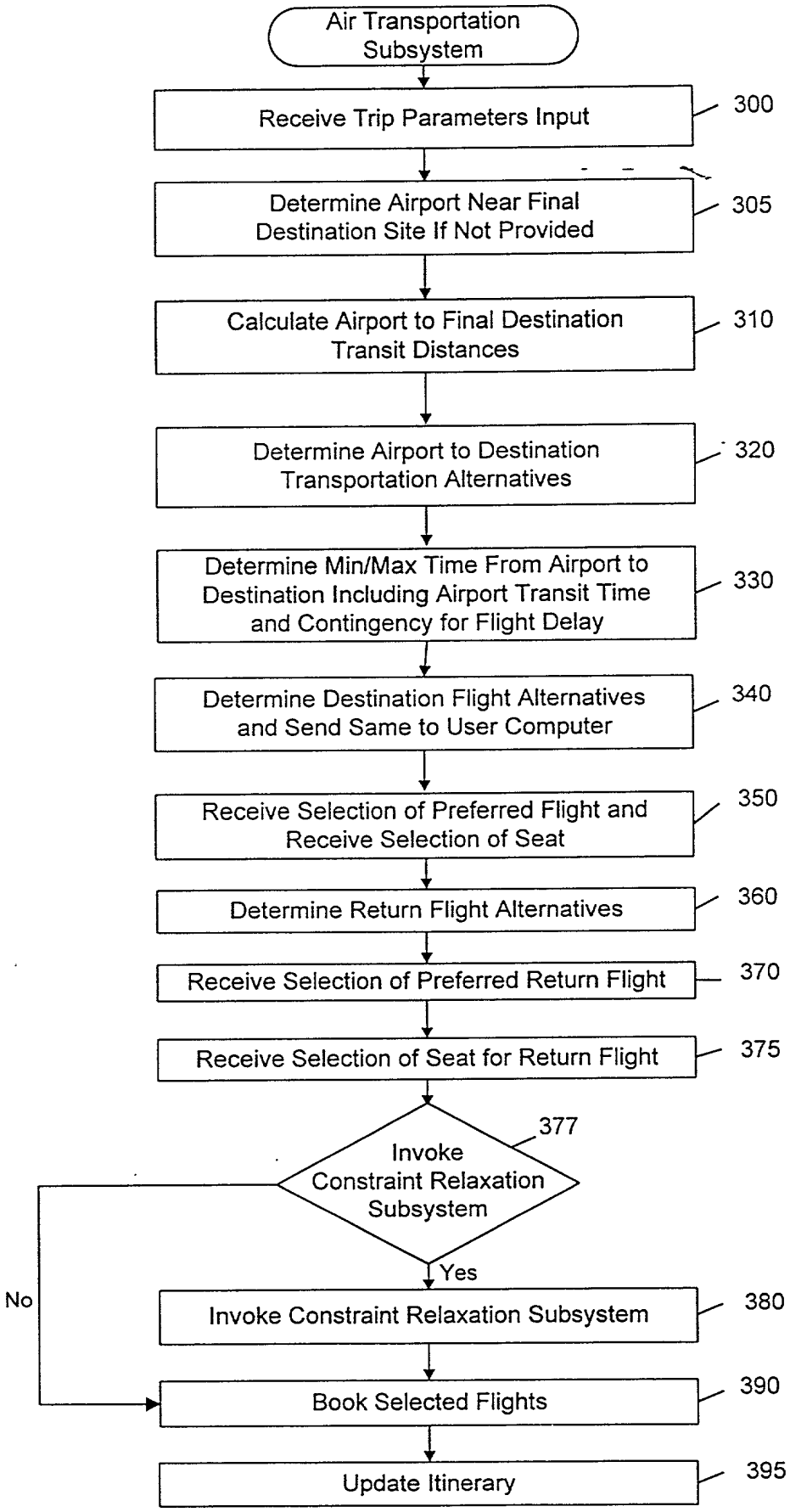
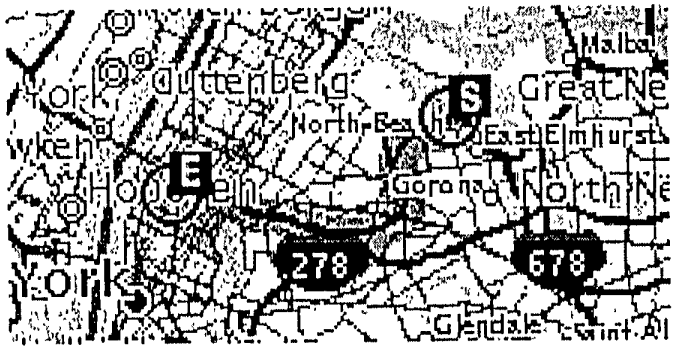

Air Transportation Subsystem
Receive Trip Parameters Input
300
Determine Airport Near Final Destination Site If Not Provided
305
Calculate Airport to Final Destination Transit Distances
310
Determine Airport to Destination Transportation Alternatives
320
Determine Min/Max Time From Airport to Destination Including Airport Transit Time and Contingency for Flight Delay
330
Determine Destination Flight Alternatives and Send Same to User Computer
340
Receive Selection of Preferred Flight and Receive Selection of Seat
350
Determine Return Flight Alternatives
360
Receive Selection of Preferred Return Flight
370
Receive Selection of Seat for Return Flight
375
Invoke Constraint Relaxation Subsystem
377
Yes
No
Invoke Constraint Relaxation Subsystem
380
Book Selected Flights
390
Update Itinerary
395

FIG. 3a

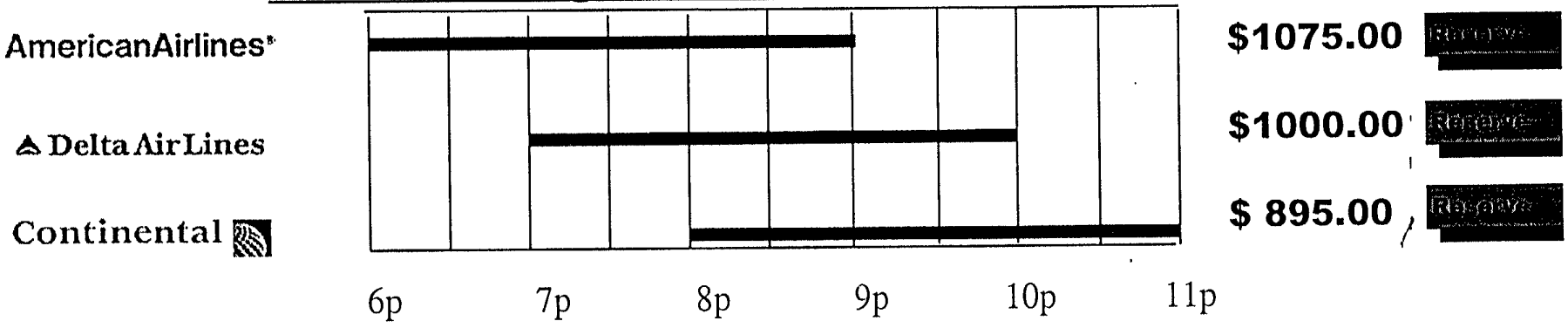
Goal Seeker has determined that driving time from La Guardia To 5 Penn Plaza is 60 minutes. To arrive at 5 Penn Plaza on 9/8 at 9am you must leave Dallas on 9/7

La Guardia to 5 Penn Plaza



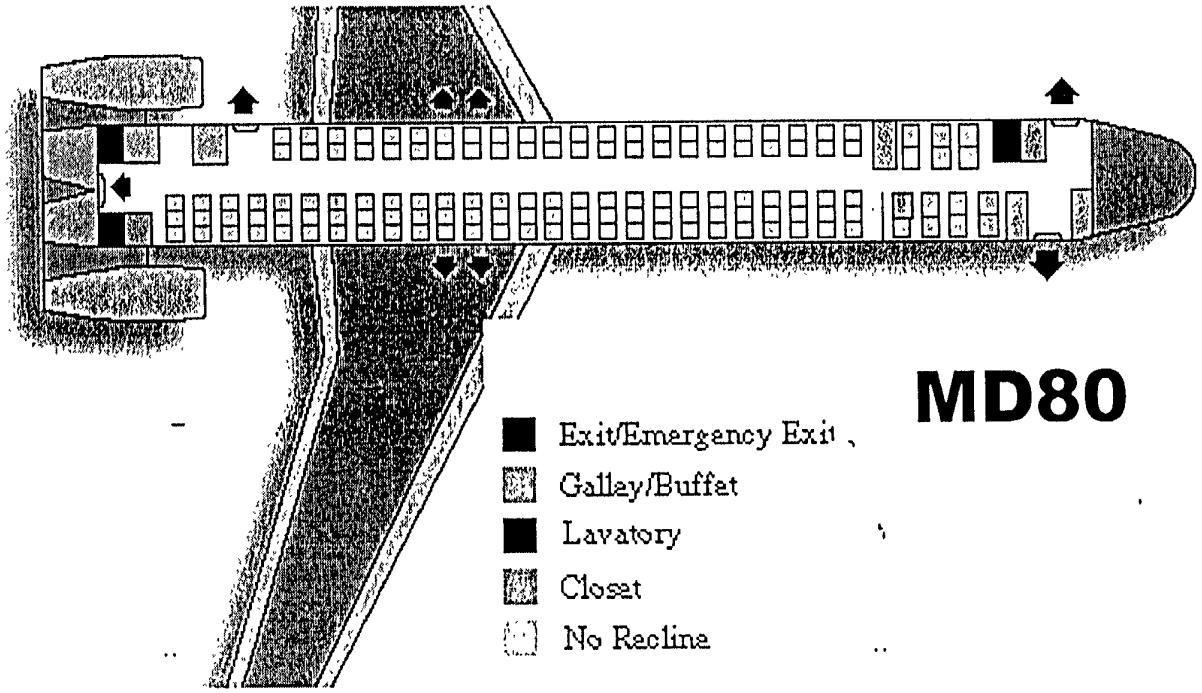
Driving Time 90 Minutes

Available Flights on 9/7 Starting at 6pm



Seat Selection

Flight 980 Dallas-New York



MD80

Seat 5B Selected Flight 980 Reserved

Goal Seeker suggests you obtain a hotel and car in New York
Click NEXT for suggested hotel and car

NEXT

Fig. 3C

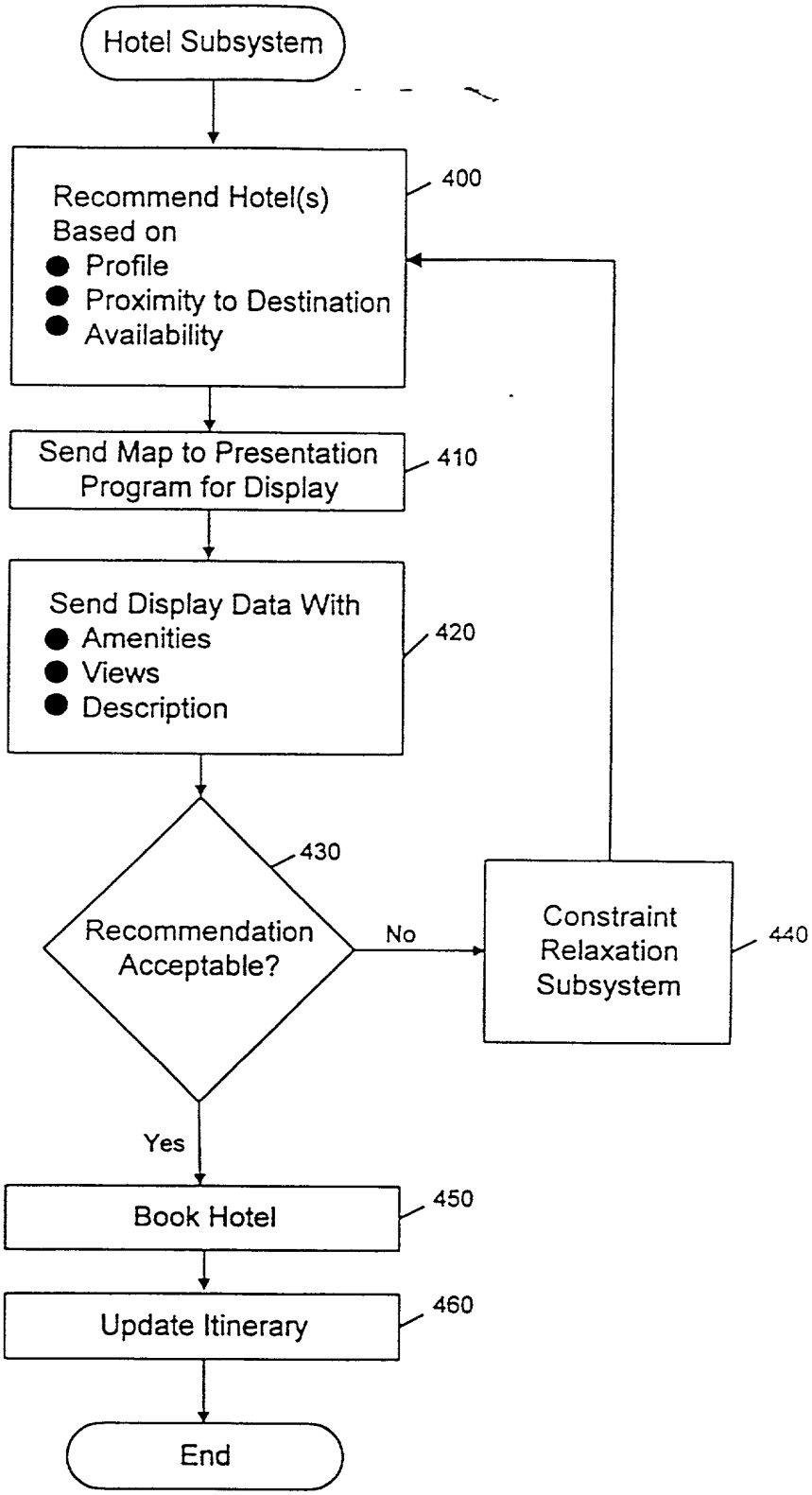

Hotel Subsystem
Recommend Hotel(s) Based on
Profile
Proximity to Destination
Availability
400
Send Map to Presentation Program for Display
410
Send Display Data With
Amenities
Views
Description
420
Recommendation Acceptable?
430
No
Constraint Relaxation Subsystem
440
Yes
Book Hotel
450
Update Itinerary
460
End

FIG. 4a

Goal Seeker suggests...

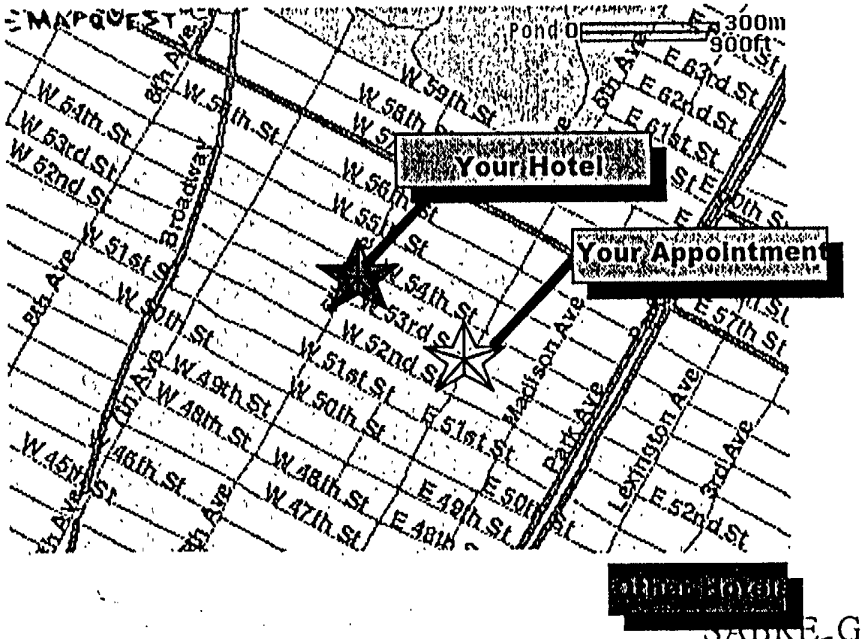
NEW YORK HILTON AND TOWERS

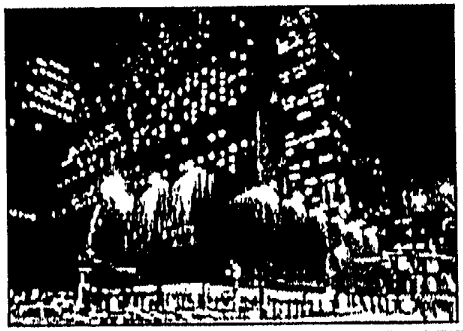
1335 AVE OF AMERICAS
NEW YORK NY 10019
PHONE: 212-586-7000
FAX: 212-315-1374

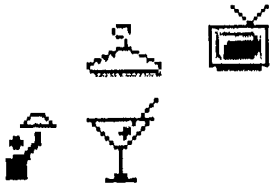
$217.00 Per Night

BOOK NOW

THE NEW YORK HILTON AND TOWERS HAS THE PERFECT LOCATION At ROCKEFELLER CENTER, IN THE MIDDLE OF MANHATTANS MAGICAL ATTRACTIONS. A FAVORITE HOTEL OF BUSINESS AND LEISURE TRAVELERS WORLDWIDE, HOTEL GUESTS ARE IN THE HEART OF THE BUSINESS AND MEDIA CAPITAL OF THE WORLD, ONE BLOCK FROM 5TH AVENUE SHOPPING AND ONLY A FEW BLOCKS FROM CENTRAL PARK AND BROADWAY







next

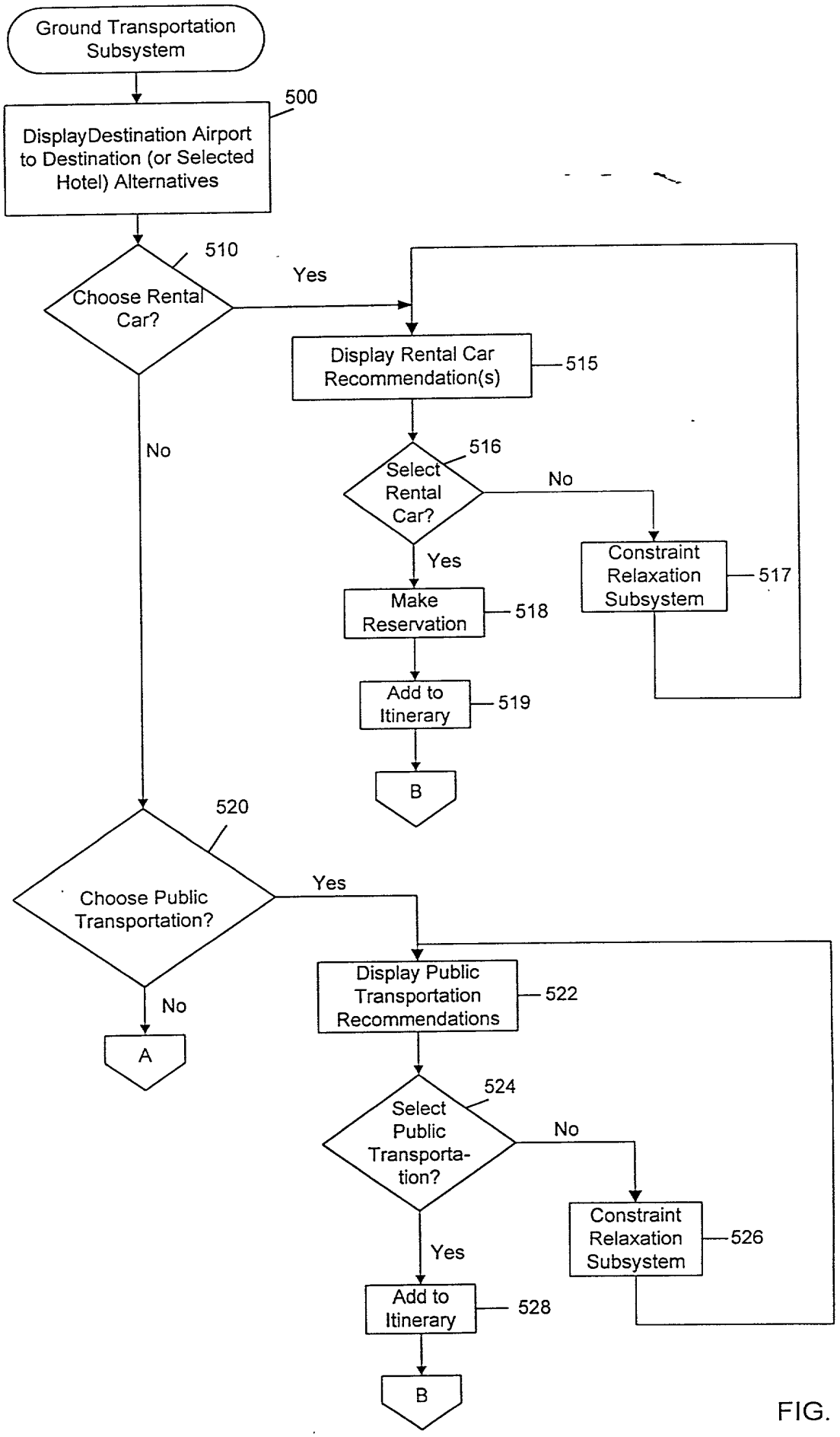

Ground Transportation Subsystem
500
DisplayDestination Airport to Destination (or Selected Hotel) Alternatives
510
Choose Rental Car?
Yes
No
Display Rental Car Recommendation(s)
515
516
Select Rental Car?
No
Yes
Constraint Relaxation Subsystem
517
Make Reservation
518
Add to Itinerary
519
B
520
Choose Public Transportation?
Yes
No
A
Display Public Transportation Recommendations
522
524
Select Public Transporta-tion?
No
Yes
Constraint Relaxation Subsystem
526
Add to Itinerary
528
B

FIG. 5a

Goal Seeker suggests...

ZZZ RENT A CAR

Intermediate Car

CAR SIZE AND TYPE	Intermediate Car Automatic with Air Conditioning
CAR COMPANY	
CAR RENTAL CITY	LAGUARDIA-NEW YORK
PICK UP ON	September 9, 10:00 AM
RETURN ON	September 10, 10:00 AM
RATE*	86.99 Daily Standard Rate
EXTRA DAY AND HOUR RATE	86.99 Per Day, 29.00 Per Hour
MILEAGE ALLOWANCE	Unlimited

Other Cars | Buy Now

Since You Are Staying Overnight Would You Like A Restaurant Recommendation?

6

Next

Fig. 56

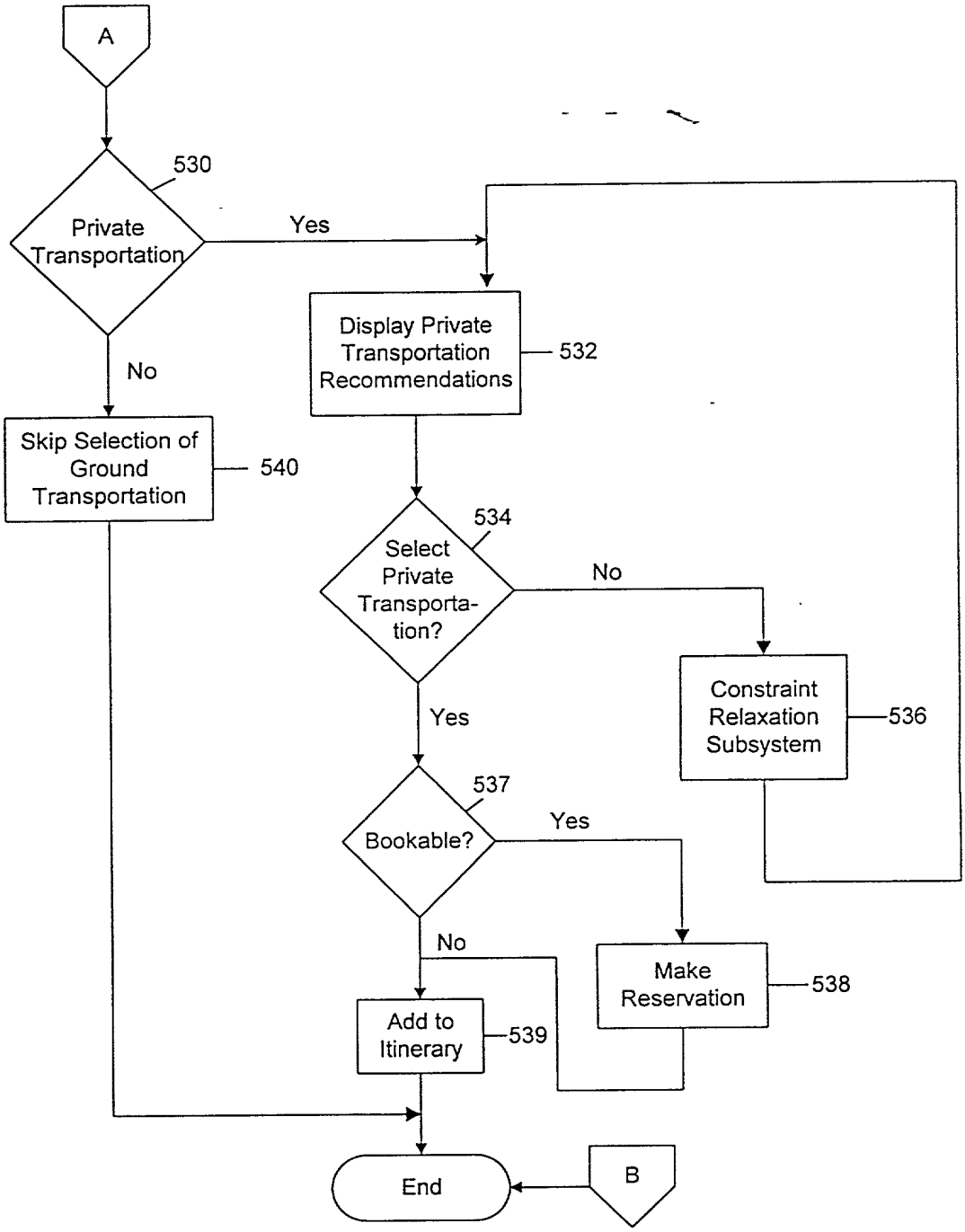

A
530
Private Transportation
Yes
No
Display Private Transportation Recommendations
532
Skip Selection of Ground Transportation
540
534
Select Private Transporta-tion?
No
Yes
Constraint Relaxation Subsystem
536
537
Bookable?
Yes
No
Make Reservation
538
Add to Itinerary
539
End
B

FIG. 5c

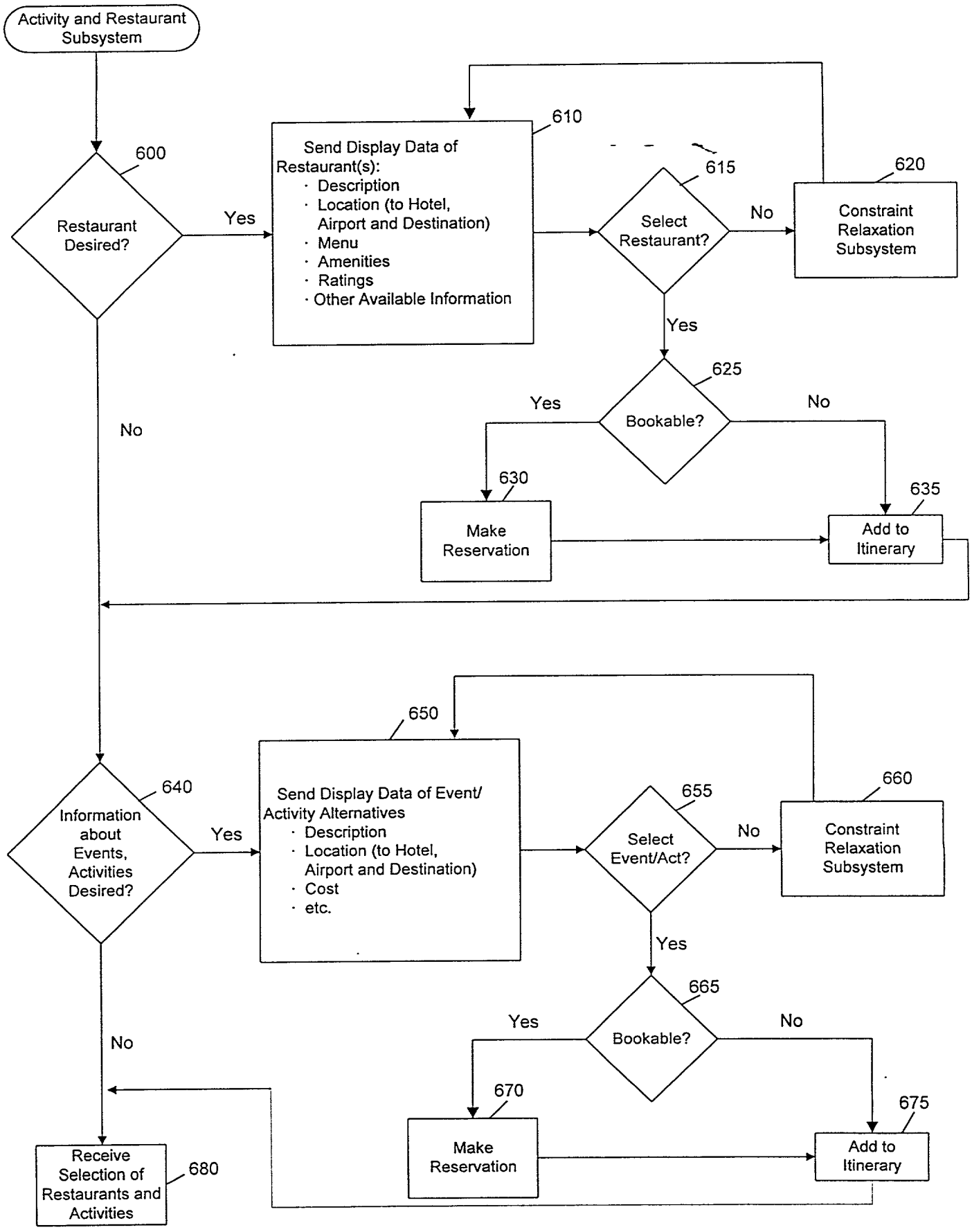
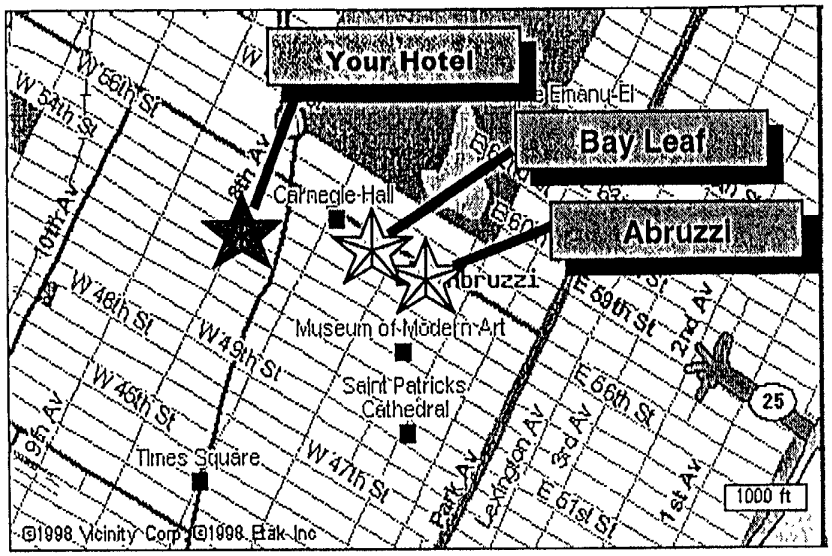

Activity and Restaurant Subsystem
600
Restaurant Desired?
Yes
No
610
Send Display Data of Restaurant(s):
· Description
· Location (to Hotel, Airport and Destination)
· Menu
· Amenities
· Ratings
· Other Available Information
615
Select Restaurant?
No
620
Constraint Relaxation Subsystem
Yes
625
Bookable?
Yes
No
630
Make Reservation
635
Add to Itinerary
640
Information about Events, Activities Desired?
Yes
No
650
Send Display Data of Event/ Activity Alternatives
· Description
· Location (to Hotel, Airport and Destination)
· Cost
· etc.
655
Select Event/Act?
No
660
Constraint Relaxation Subsystem
Yes
665
Bookable?
Yes
No
670
Make Reservation
675
Add to Itinerary
680
Receive Selection of Restaurants and Activities

FIG. 6a

Goal Seeker

suggests...



Click on Restaurant for info

Abruzzi
37 West 56th Street - New York, NY 10019
Phone: 212-489-8111
Italian, Italian
Maps | Driving Directions | Visitor Reviews | Reservations

Cuisine	Ambiance	Special Features
Italian	Bright Lights Festive Romantic	Transmedia Family

Bay Leaf
49 W 56th Street - New York, NY 10019
Phone: 212-957-1818
Indian, Indian
Maps | Driving Directions | Visitor Reviews | Reservations

Cuisine	Ambiance	Special Features
Indian	Elegant Festive Quiet Romantic	Transmedia

Beefsteak Charlies
851 8th Ave - New York, NY 10019
Phone: 212-757-3110
American, American
Maps | Driving Directions | Visitor Reviews | Reservations

Cuisine	Ambiance	Special Features
American	Festive Neighborly	Video Arcade Family

Fig. 66

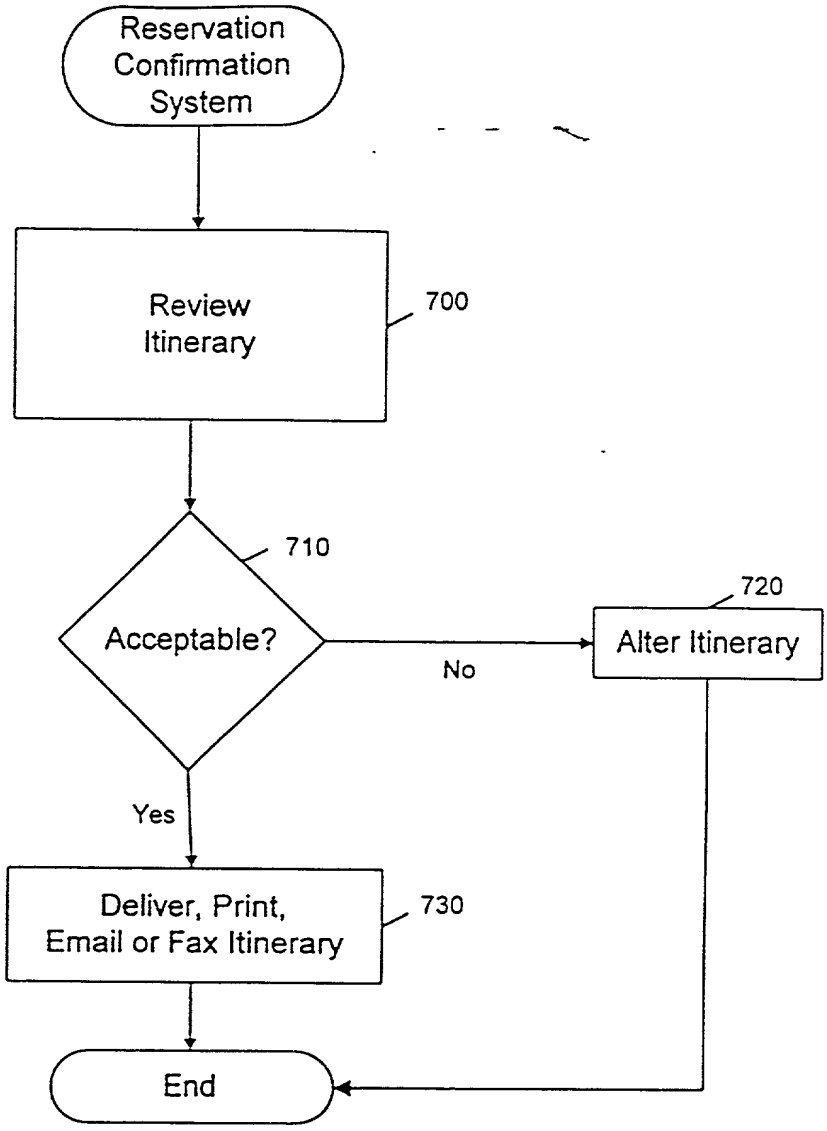

Reservation Confirmation System
Review Itinerary
700
Acceptable?
710
No
Alter Itinerary
720
Yes
Deliver, Print, Email or Fax Itinerary
730
End

FIG. 7

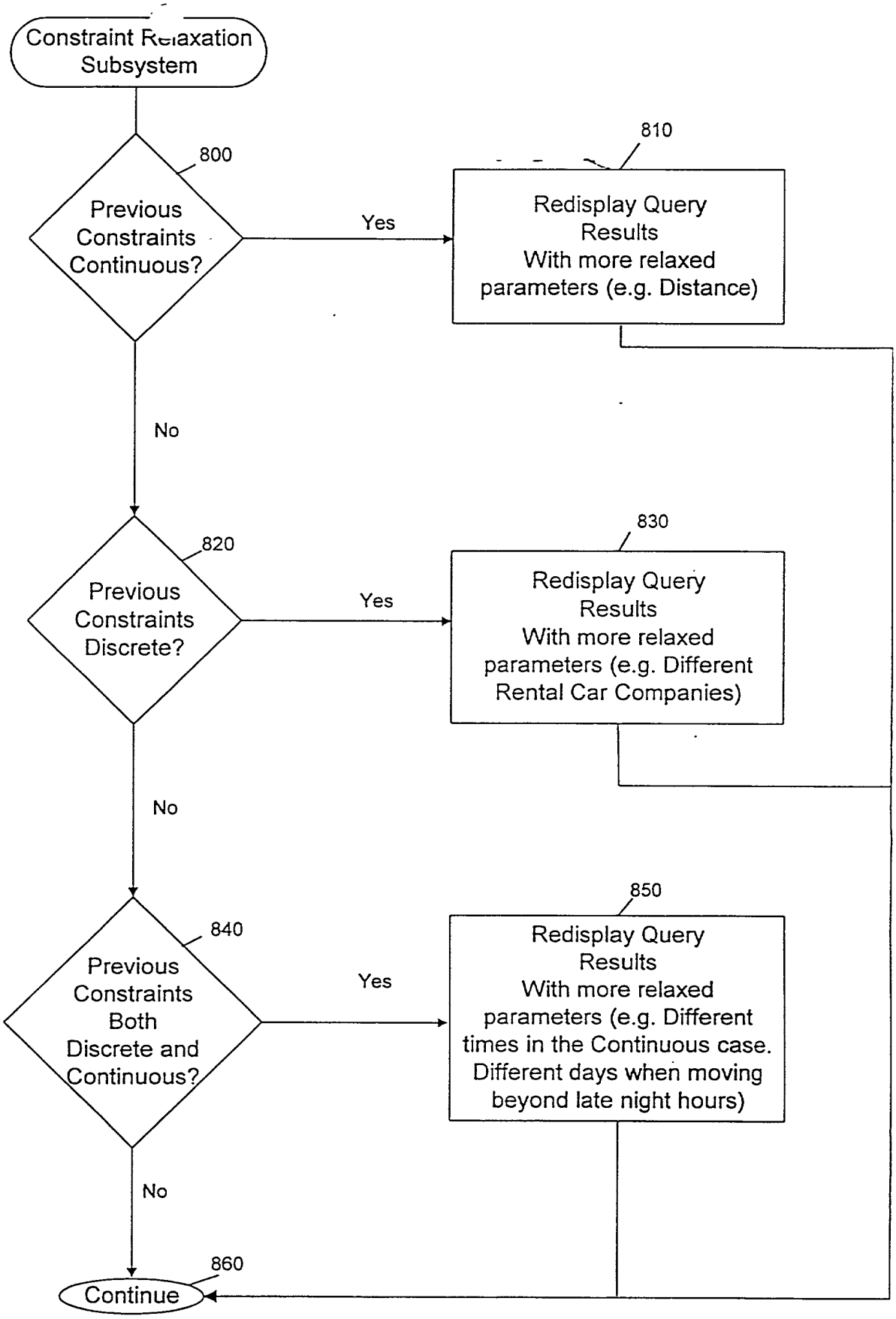

Constraint Relaxation Subsystem
800
Previous Constraints Continuous?
Yes
810
Redisplay Query Results With more relaxed parameters (e.g. Distance)
No
820
Previous Constraints Discrete?
Yes
830
Redisplay Query Results With more relaxed parameters (e.g. Different Rental Car Companies)
No
840
Previous Constraints Both Discrete and Continuous?
Yes
850
Redisplay Query Results With more relaxed parameters (e.g. Different times in the Continuous case. Different days when moving beyond late night hours)
No
860
Continue

FIG. 8a

Here's the closest match for your itinerary.

The fare for this itinerary is $578 per person, $1156 for 2 passengers

		Airline	Flight	Departure	Arrival	Stops	Meal
Outbound	Requested			DEN 25 Sep 9:00 am	SJC		
	Best fit	UA	279	DEN 25 Sep 8:25 am	SJC 9:55 am	0	S
Return	Requested			SJC 3 Oct	DEN 6:00 pm		
	Best fit	UA	708	SJC 3 Oct 2:25 pm	DEN 5:52 pm	0	

Now let's work on finding you a lower fare.

To do this, we may need to adjust your itinerary, The more flexible you can be, the more likely we can find you a better deal.

Here are some ways where flexibility may pay off. Please click on the appropriate buttons to tell us how willing you are to adjust:

Outbound journey

This is how flexible I am on **departing one day earlier:** ○○○○○○○○○◉ **Completely.....Not at all**	This is how flexible I am on **departing one day later:** ○○○○○○○○○◉ **Completely.....Not at all**

FIG. 86

This is how flexible I am on **departing one day earlier:** ○ ○ ○ ○ ○ ○ ○ ○ ○ ◉ Completely.....Not at all	This is how flexible I am on **departing one day later:** ○ ○ ○ ○ ○ ○ ○ ○ ○ ◉ Completely.....Not at all
This is how flexible I am on **departure and/or arrival time:** ○ ○ ○ ○ ○ ○ ○ ○ ○ ◉ Completely.....Not at all	This is how flexible I am on **connecting flights versus direct:** ○ ○ ○ ○ ○ ○ ○ ○ ○ ◉ Completely.....Not at all
This is how flexible I am on **alternative departure city (up to 50 miles distant):** ○ ○ ○ ○ ○ ○ ○ ○ ○ ◉ Completely.....Not at all	This is how flexible I am on **alternative arrival city (up to 50 miles distant):** ○ ○ ○ ○ ○ ○ ○ ○ ○ ◉ Completely.....Not at all

Length of stay

This is how flexible I am on **leaving earlier to include a Saturday night:** ○ ○ ○ ○ ○ ○ ○ ○ ○ ◉ Completely.....Not at all	This is how flexible I am on **returning later to include a Saturday night:** ○ ○ ○ ○ ○ ○ ○ ○ ○ ◉ Completely.....Not at all

FIG. 8c

Here's the original itinerary.

The fare for this itinerary is $578 per person, $1,156 for 2 passengers

		Airline	Flight	Departure	Arrival	Stops	Meal
Outbound	Requested			DEN 25 Sep 9:00 am	SJC		
	Best fit	UA	279	DEN 25 Sep 8:25 am	SJC 9:55 am	0	S
Return	Requested			SJC 3 Oct	DEN 6:00 pm		
	Best fit	UA	708	SJC 3 Oct 2:25 pm	DEN 5:52 pm	0	

Here are some alternatives, in ascending price sequence.

*Option1: fare $198 per person, #396 for 2 passengers**

		Airline	Flight	Departure	Arrival	Stops	Meal
Outbound	Requested			DEN 25 Sep 9:00 am	SJC		
	Option 1	QQ	1427	DEN 25 Sep 7:48 am	RNO 8:23 am	0	S
		QQ*	1633	RNO 9:38am	OAK* 10:28 am	0	
Return	Requested			SJC 3 Oct	DEN 6:00 pm		
	Option 1	QQ	1335	OAK* 3 Oct 1:50 pm	RNO 2:40 pm	0	
		QQ*	1708	RNO 3:22 pm	DEN 5:37 pm	0	

FIG. 8J

Attorney Docket No. 07099.0003-00000

DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that: my residence, post office address and citizenship are as stated below next to my name; I believe I am an original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled: GOAL ORIENTED TRAVEL PLANNING SYSTEM, the specification of which is attached.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims. I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56.

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. **FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P., Reg. No. 22,540**, Douglas B. Henderson, Reg. No. 20,291; Ford F. Farabow, Jr., Reg. No. 20,630; Arthur S. Garrett, Reg. No. 20,338; Donald R. Dunner, Reg. No. 19,073; Brian G. Brunsvold, Reg. No. 22,593; Tipton D. Jennings IV, Reg. No. 20,645; Jerry D. Voight, Reg. No. 23,020; Laurence R. Hefter, Reg. No. 20,827; Kenneth E. Payne, Reg. No. 23,098; Herbert H. Mintz, Reg. No. 26,691; C. Larry O'Rourke, Reg. No. 26,014; Albert J. Santorelli, Reg. No. 22,610; Michael C. Elmer, Reg. No. 25,857; Richard H. Smith, Reg. No. 20,609; Stephen L. Peterson, Reg. No. 26,325; John M. Romary, Reg. No. 26,331; Bruce C. Zotter, Reg. No. 27,680; Dennis P. O'Reilley, Reg. No. 27,932; Allen M. Sokal, Reg. No. 26,695; Robert D. Bajefsky, Reg. No. 25,387; Richard L. Stroup, Reg. No. 28,478; David W. Hill, Reg. No. 28,220; Thomas L. Irving, Reg. No. 28,619; Charles E. Lipsey, Reg. No. 28,165; Thomas W. Winland, Reg. No. 27,605; Basil J. Lewris, Reg. No. 28,818; Martin I. Fuchs, Reg. No. 28,508; E. Robert Yoches, Reg. No. 30,120; Barry W. Graham, Reg. No. 29,924; Susan Haberman Griffen, Reg. No. 30,907; Richard B. Racine, Reg. No. 30,415; Thomas H. Jenkins, Reg. No. 30,857; Robert E. Converse, Jr., Reg. No. 27,432; Clair X. Mullen, Jr., Reg. No. 20,348; Christopher P. Foley, Reg. No. 31,354; John C. Paul, Reg. No. 30,413; Roger D. Taylor, Reg. No. 28,992; David M. Kelly, Reg. No. 30,953; Kenneth J. Meyers, Reg. No. 25,146; Carol P. Einaudi, Reg. No. 32,220; Walter Y. Boyd, Jr., Reg. No. 31,738; Steven M. Anzalone, Reg. No. 32,095; Jean B. Fordis, Reg. No. 32,984; Barbara C. McCurdy, Reg. No. 32,120; James K. Hammond, Reg. No. 31,964; Richard V. Burgujian, Reg. No. 31,744; J. Michael Jakes, Reg. No. 32,824; Dirk Thomas, Reg. 32,600; Thomas W. Banks, Reg. 32,719; Christopher P. Isaac, Reg. No. 32,616; Bryan C. Diner, Reg. No. 32,409; M. Paul Barker, Reg. No. 32,013; Andrew Chanho Sonu, Reg. No. 33,457; David S. Forman, Reg. No. 33,694; Vincent P. Kovalick, Reg. No. 32,867; and Debbie Segers, Reg. No. 40,805 of The SABRE Group, Inc. Please address all correspondence to **FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P.,** 1300 I Street, N.W., Washington, D.C. 20005, Telephone No. (202) 408-4000.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

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Full Name of Inventor	Inventor's Signature	Date
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Post Office Address The SABRE Group, Inc. 4255 Amon Carter Blvd. MD 4204 Fort Worth, TX 76155		